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SUPPURATIVE LUNG DISEASE

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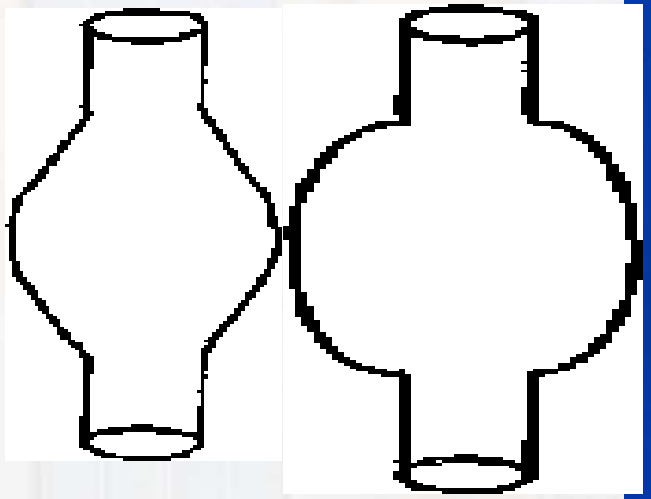
- Objective
- To identify definition and etiology of SLD
- To know clinical picture and how to diagnose
- To have the necessary knowledge on how to treat

- **Definition:**
    - Is a syndrome characterized by expectoration of excessive amount of purulent sputum, usually fetid and related to posture.
- **It includes:**

1. Bronchiactasis
2. Lung abscess.
3. Empyema with bronchopleural fistula.
4. cystic fibrosis.

1. Bronchiectasis

- **Definition:**
- It is an acquired disorder, characterized by abnormal and permanently dilated airways.
- Bronchial walls become inflamed, thickened and irreversibly damaged.
- The mucociliary transport mechanism is impaired.



1. Bronchiectasis

- **Etiology:**
- Bronchiectasis requires two factors to
- (1) An infectious insult
- Severe infection leads to destruction of the bronchial wall and supportive tissues hence abnormal dilatation.

Pulmonary infections

- Bacterial infections: virulent bacterial infections, especially with potentially necrotizing organisms eg. staphylococcus, klebsiella M. tuberculosis and anaerobes.
- Viral infections: adenovirus and influenza with lower respiratory tract involvement.

Humoral immunodeficiency

Rheumatoid arthritis and Sjogren's syndrome

Allergic bronchopulmonary aspergillosis

- suspected in cases with a long history of asthma associated with productive cough of mucopurulent sputum. Characterized by eosinophilia and proximal bronchiectasis (upper lobe).

1. Bronchiectasis

- **Etiology:**
- Bronchiectasis requires two factors to

(1) An infectious insult

(2) Impairment of drainage:

- due to airway obstruction, and/or a defect in host defense.
- Impairment of drainage leads to retention of secretion which enhancing bacterial infection.

1. Bronchiectasis

- Airway obstruction due to: Foreign body aspiration, lymphadenopathy
- Chronic obstruction by viscid mucus in:
- Cystic fibrosis (CF):
- Dyskinetic cilia :leading to poor mucociliary clearance, repeated respiratory infections, and subsequent bronchiectasis.
- Kartagener's syndrome (dextrocardia, immotile cilia, sinusitis, bronchiectasis).
- Focal bronchiectasis: typically develops as a result of untreated pneumonia or obstruction

1. Bronchiectasis

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- **Clinical picture:**

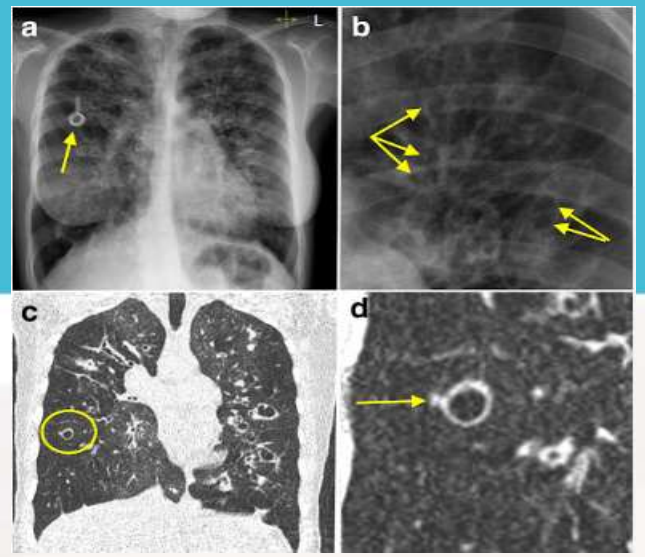
A. Symptoms:

- Frequent bacterial infections leading to cough with daily production of mucopurulent and tenacious sputum. Large amount of sputum, yellowish or greenish in color, usually related to certain position (on leaning forward) and worse in the morning, lasting months to years.
- Intermittent hemoptysis, blood stained sputum or massive hemorrhage.
- Less specific complaints include dyspnea, wheezing, and pleuritic chest pain
- Recurrent febrile episodes with malaise due to frequent bouts of "bronchitis" requiring therapy with repeated courses of antibiotics.

B. Sign

- Clubbing and halitosis (bad breath).
- Chest examination: Coarse crackles heard over infected areas, usually lung bases. In addition to rhonchi
- In advanced cases, hypoxemia and right-sided heart failure developed due to pulmonary hypertension00

1. Bronchiectasis



- **Investigations:**

A. <u>Imaging</u>

- ❑ Chest x-ray:
  - may be normal
  - In advanced disease, thickened airway walls, cystic bronchiectatic spaces and associated areas of pneumonic consolidation or collapse may be visible.
- ❑ High resolution CT:
  - bronchial dilatation and wall thickening.

B. <u>Bronchoscopy:</u>

- diagnostic tool in focal bronchiectasis eg obstruction by foreign body, lymph node or tumor.

C. <u>Pulmonary function tests:</u>

- decreased FEV1 and I or FEVI/FVC ratio.

D. <u>Laboratory:</u>

- Sputum examination with culture and sensitivity.
- Serum immunoglobulins.
- Sweat electrolytes (in cystic fibrosis).

1. Bronchiectasis

- **Treatment:**
  - ❑ **Postural draining** at least three times daily for 10-20 min.
  - ❑ **Antibiotics:**
    - ✓ To treat an acute exacerbation and recurrent infections by eradication of pathogens.
    - ✓ Frequent bacterial pathogens H. influenza and pseudomonas aeruginosa.
    - ✓ Parentral antibiotic, oral and aerosolized are used.
    - ✓ Daily antibiotic for 7-14 days of each month.
    - ✓ Antibiotics include amoxicillin, azithormycin, quinolones, fluoroquinolone, second generation cephalosporin and aminoglycoside.
  - ❑ **Bronchodilators** in patients with airflow limitation.
  - ❑ **Surgery**
    - ✓ Indicated for
      a) localized cases and cases with massive hemoptysis

Treatment of hemoptysis:

a) Bed rest and antibiotics.
b) Blood transfusion if required.
c) Bronchial artery embolization.
d) Surgical resection.

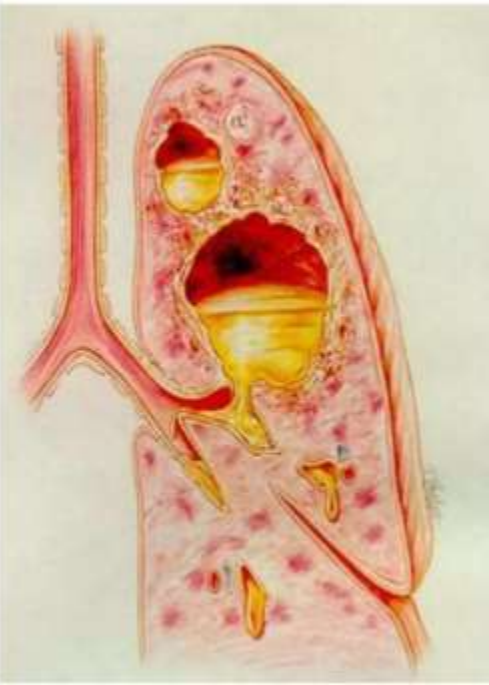
1. Bronchiectasis

Complications:

- Pneumonia, pneumothorax, empyema.
- Metastatic cerebral abscess.
- Severe life threatening hemoptysis.
- Respiratory failure, cor-pulmonale.
- Amyloidosis.

2. Lung Abscess

- **Definition**
- It is a severe Localized suppuration in the lung associated with cavity formation and presence of a fluid level that is not due to tuberculosis.



2. Lung Abscess

- **Etiology:**

1. **<u>Causative organisms</u>**

- Include: Numerous different infectious agents (eg aerobic bacteria). However, anaerobes have been identified as the most common causative bacteria.
- Lung abscesses are associated with anaerobic bacteria either as the primary pathogens or in combination with aerobic bacterial agents.
- Among neoplastic abcess cases, primary squamous carcinoma is the most common malignancy associated with lung abscess.

2. Lung Abscess

- **Etiology:**

2. **<u>Predisposing factors:</u>**

❑Aspiration

- especially altered consciousness (septic material during mouth or nose operation and vomitus in comatosed patient) or oropharyngeal and esophageal dysfunction.

❑Inhalation of foreign body.

❑Bronchial obstruction (e.g bronchial carcinoma, lymph node).

❑Inadequately treated pneumonia.

❑Pneumonia caused by Staph. aureus or Klebsiella pneumoniae.

❑Septic emboli.

❑Infected pulmonary infarction.

❑Amoebic abscess.

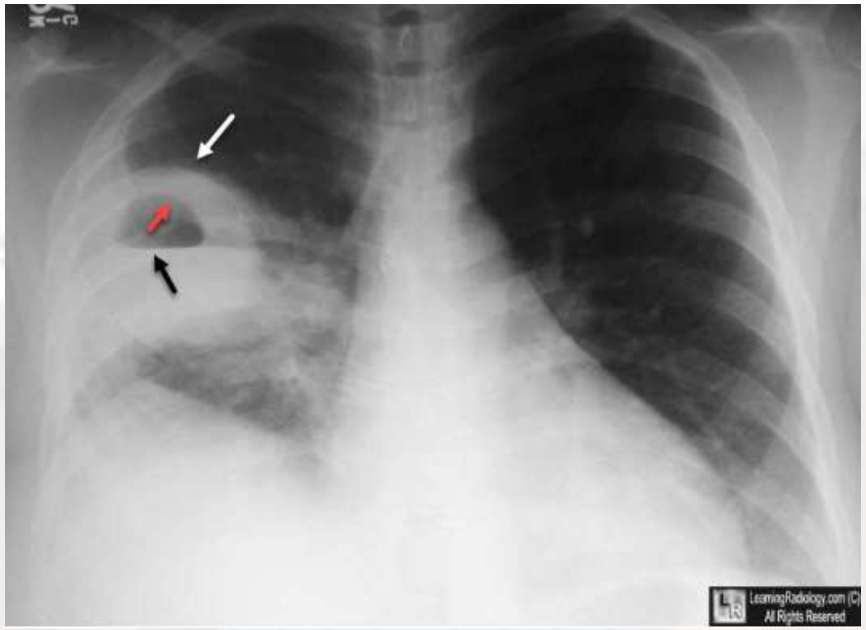
2. Lung Abscess

- **Clinical picture:**
  - Acute (Less than 4-6 weeks) or chronic (more than 6 weeks).
- **<u>Symptoms:</u>**
  - Cough, foul smelling sputum, large amount, increased on lying on the opposite side
  - hemoptysis.
  - Fever, chills, night sweats, anorexia, pleuritic chest pain.
- **<u>Signs:</u>**
  - Finger clubbing (chronic).
  - Chest signs may be few (in deep central abscess).
  - In superficial abscess sings of consolidation or sings of cavitation may be found (Increased TVF, localized dullness on percussion, bronchial breathing, coarse inspiratory crepitations & positive vocal resonance).
  - May be associated with signs of pleurisy or pleural effusions.

2. Lung Abscess

- **Diagnosis:**
- **CBC** with differential may reveal a polymorphnuclear leukocytosis with shift to the left.
- **Chest x-ray:** cavitary lesion with an air fluid level with or without surrounding infiltrate.
- **Chest CT scan.**
- **Sputum culture and sensitivity**: is useful in non-anaerobic pulmonary infections because sputum can be contaminated with anaerobes as it is expectorated through the oral cavity and thus the finding of these organisms is not specific.
- **Blood culture** is also appropriate.

2. Lung Abscess



2. Lung Abscess

- **Treatment:**

1. **<u>Antibiotics:</u>**
   - ❑ Appropriate antibiotic treatment is giving for up to 6 weeks.
   - ❑ Antibiotics should be given to cover both aerobic and anaerobic organisms.
   - ❑ The initial choice of antimicrobial agents is empirical (penicillin, cefoxitin, metronidazole, clindamycin and piperacillin) then it should be adjusted according to the culture and sensitivity.
   - ❑ For example an appropriate initial choice is cefuroxime I g i.v.6-hourly and metronidazole 500 mg i.v.8 hourly for 5 days, oral cefaclor and metronidazole for a prolonged period depending on the bacterial sensitivities.
2. **<u>Postural drainage</u>** bronchoscopy may help followed by effective good drainage.
3. **<u>Surgical resection</u>**
   - ❑ of necrotic lung may occasionally be needed if:
     a) poor response to antibiotic
     b) airway obstruction limits drainage.
     c) complications such as massive hemoptysis, bronchopleural fistul a, and empyema.

2. Lung Abscess

- **Complications:**
  - ❑Empyema formation resulting from a Broncho pleural fistula.
  - ❑Massive hemoptysis.
  - ❑Spontaneous rupture into uninvolved lung segments.
  - ❑Non-resolution of abscess cavity with residual fibrosis and bronchiectasis.

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